In the United States Court of Federal Claims

No. 12-889L and No. 13-404L (Consolidated)

(Filed: March 8, 2017)

(As Amended upon Reconsideration: May 10, 2017)

CLAUDE SEARS, et al., **Plaintiffs,** **v.** **UNITED STATES,** **Defendant.**	Post-trial determination of the just compensation due in a rails-to-trails case; value of the agricultural land taken for trail use; cost to reclaim; severance damages attributable to "point rows;" no preemption of Iowa statute guaranteeing access to fields otherwise landlocked by the trail

Thomas S. Stewart, Stewart Wald & McCulley LLC, Kansas City, Missouri, for plaintiffs. With him on the briefs and at trial was Elizabeth G. McCulley, Stewart Wald & McCulley LLC, Kansas City, Missouri. Also with him on the briefs were Steven M. Wald and Michael J. Smith, Stewart Wald & McCulley LLC, St. Louis, Missouri.

Jared S. Pettinato, Trial Attorney, Natural Resources Section, Environment & Natural Resources Division, United States Department of Justice, Washington, D.C., for defendant. Representing defendant at trial were Gregory D. Page, Trial Attorney, Natural Resources Section, Environment & Natural Resources Division, United States Department of Justice, Washington, D.C., and David Negri, Trial Attorney, Natural Resources Section, Environment & Natural Resources Division, United States Department of Justice, Boise, Idaho. With Mr. Pettinato on the briefs was John C. Cruden, Assistant Attorney General, Environment & Natural Resources Division, United States Department of Justice, Washington, D.C.

OPINION AND ORDER

LETTOW, Judge.

This post-trial opinion addresses claims by a subclass of plaintiffs who own sixteen parcels attendant to the right-of-way of a railroad line formerly operated by the Iowa River Railroad in Hardin and Marshall Counties, Iowa, that has been converted into a recreational trail under Section 208 of the National Trails System Act Amendments of 1983, Pub. L. No. 98-11, § 208, 97 Stat. 42, 48 (codified at 16 U.S.C. § 1247(d)) ("Trails Act"). All issues of liability were resolved prior to trial, see Sears v. United States, 124 Fed. Cl. 444, 446 (2015) ("Sears I"), and therefore the trial solely focused on the valuation of the land underlying the right-of-way and the effect of the right-of-way on the value of plaintiffs' adjacent parcels.

A five-day trial was held in Eldora, Iowa, commencing on August 1, 2016 and ending on August 5, 2016. Following post-trial briefing, the court heard closing arguments on December 20, 2016.

After a decision and judgment were issued on March 8, 2017, defendant filed a motion for reconsideration limited to analysis of point row damages. The court called for and received a response, and, upon consideration, grants the motion for reconsideration in part and amends its prior decision and judgment, as stated infra.

INTRODUCTORY SYNOPSIS OF FACTS[1]

The land at issue was previously held as a right-of-way for railroad purposes by the Iowa River Railroad, "extending from milepost 243.35 near Marshalltown, Iowa, to milepost 209, outside Steamboat Rock, Iowa, a total distance of 34.35 miles, in Marshall and Hardin Counties, Iowa." Sears I, 124 Fed. Cl. at 446 (quoting Second Am. Compl. ¶ 4, ECF No. 33). On August 2, 2012, the Surface Transportation Board ("STB") issued a Notice of Interim Trail Use ("NITU") pursuant to the Trails Act. Id. The NITU "allow[ed] the general public to use the [Iowa River Railroad] right-of-way as a trail" while preserving the corridor for potential future railroad use. Id.

On July 10, 2013, the court certified a class of "[a]ll persons who . . . own an interest in lands constituting part of the railroad line that was formerly operated by the [Iowa River Railroad] in Marshall and Hardin Counties, Iowa." Sears I, 124 Fed. Cl. at 446 (quoting Class Certification Order at 1, ECF No. 14) (alteration in original). The parties resolved all issues of liability following discovery and reached a tentative settlement in principle regarding valuation and compensation for the 269 parcels at issue in the class. See id. at 446-47. The owners of 21 of the 269 parcels withdrew from the settlement negotiations before the negotiations were completed, however, and those owners sought a trial regarding the valuation of their particular parcels. Id. at 447. The 21 parcels all "are agricultural properties that are angularly bifurcated by the former rail line." Id. On December 22, 2015, the court approved the division of the class into separate trial and settlement subclasses pursuant to RCFC 23. Id. at 451.[2]

Prior to trial, plaintiffs who collectively own five parcels opted out of the trial subclass and decided to join the settlement subclass. See Pre-Trial Conference Tr. 16:7-13 (July 25, 2016). Thus, the trial subclass consists of sixteen parcels of land, all of which are agricultural parcels in central Iowa that are bisected by the right-of-way at issue. See Pls.' Post-Trial Br. at 1,

[1]The recitation of facts in this opinion constitutes the court's principal findings of fact in accord with Rule 52(a) of the Rules of the Court of Federal Claims ("RCFC"). This introductory synopsis of facts should be coupled with more extensive findings of fact and rulings on questions of mixed fact and law set out in the court's analysis.

[2]After a delay of well over a year, the tentative settlement agreement pertaining to the settlement subclass has finally been submitted for review by the pertinent government officials for their potential approval. See Joint Status Report (Feb. 17, 2017), ECF No. 125.

ECF No. 113. The parcels were addressed at trial in five clusters, delineated by ownership. See id. Parcels 77.A and 77.B are owned by Jay Denzil Gould; parcels 87.A and 87.B are owned by John and June Bradley; parcels 89.A, 89.B, and 89.C are owned by Norval Mosher; parcels 91.A, 91.B, 91.C, and 91.D are owned by Charles Heene; and parcels 120.A, 120.B, 120.C, 120.D, and 120.E are owned by the Estate of Richard K. Richards, care of Virginia Richards and Beth Richards. Id.; see also PX 1.A (Gould Ownership Deed for the 77 Parcels); PX 2.A (Bradley Ownership Deed for the 87 Parcels); PX 3.A (Mosher Ownership Deed for the 89 Parcels); PX 4.A (Heene Ownership Deed for the 91 Parcels); PX 5.A (Richards Ownership Deed for the 120 Parcels).[3] Each owner is a plaintiff in the subclass.

On the first day of trial, the court conducted site visits to the Richards, Mosher, and Gould parcel clusters, and viewed the Heene parcel cluster at a distance. See Pls.' Post-Trial. Br. at 1; Tr. 109:12 to 160:7. The property owners or operators testified at trial, as did the parties' experts who addressed (1) the value of the properties subject to the taking in their before and after condition, (2) the cost to reclaim the railbed such that the land could again be used for agricultural purposes, (3) any diminution of value attributable to "point rows" caused by the angular bisecting of fields by the railbed as a trail, and (4) any diminution in value due to loss of access to landlocked fields. In addition, the court heard testimony from the officials heading the trail commissions in Hardin and Marshall Counties that are now responsible for developing and maintaining the trail for public use.

STANDARDS FOR DECISION

The Takings Clause of the Fifth Amendment provides that "private property [shall not] be taken for public use, without just compensation." U.S. Const. amend. V. This court has jurisdiction over plaintiffs' takings claims under the Tucker Act, which grants jurisdiction over "any claim against the United States founded either upon the Constitution, or any Act of Congress or any regulation of an executive department, or upon any express or implied contract with the United States, or for liquidated or unliquidated damages in cases not sounding in tort." 28 U.S.C. § 1491(a)(1). The Fifth Amendment is a money-mandating provision upon which plaintiffs may seek damages against the government under the Tucker Act. See Preseault v. *Interstate Commerce Comm'n*, 494 U.S. 1, 11-12 (1990); Schooner Harbor Ventures, Inc. v. United States, 569 F.3d 1359, 1361-62 (Fed. Cir. 2009) (citing Moden v. United States, 404 F.3d 1335, 1341 (Fed. Cir. 2005)).

In a rails-to-trails case, plaintiffs must first establish the government's liability for a taking of private property through the STB's issuance of a NITU, and that plaintiffs were owners of the fee interest underlying the right-of-way at the time of the taking. See Preseault v. United States, 100 F.3d 1525, 1533 (Fed. Cir. 1996). The date of the taking is measured at the date of the issuance of the NITU. Barclay v. United States, 443 F.3d 1368, 1373 (Fed. Cir. 2006); see also Caldwell v. United States, 391 F.3d 1226, 1233 (Fed. Cir. 2004) ("The taking, if any, when a railroad right-of-way is converted to interim trail use under the Trails Act occurs when state law reversionary property interests that would otherwise vest in the adjacent landowners are

[3]Citations to plaintiffs' exhibits are identified as "PX __" and defendant's exhibits are denoted as "DX __." Citations to the trial transcript are cited as "Tr. __."

blocked from so vesting.") (citing Preseault, 100 F.3d at 1552). The government agreed to liability during discovery, and the deeds entered into evidence at trial establish plaintiffs' ownership of the subject parcels. Thus, the court must determine the just compensation due to plaintiffs for the taking.

"[J]ust compensation normally is to be measured by 'the market value of the property at the time of the taking contemporaneously paid in money.'" United States v. 50 Acres of Land, 469 U.S. 24, 29 (1984) (quoting Olson v. United States, 292 U.S. 246, 255 (1934)). The fair market value is based on the "highest and most profitable use" for the land at issue. Olson, 292 U.S. at 255. To determine just compensation here, the court must calculate the difference between what plaintiffs had before the issuance of the NITU and what they retained afterward. See United States v. Miller, 317 U.S. 369, 376 (1943); see also Otay Mesa Prop., L.P. v. United States, 670 F.3d 1358, 1364 (Fed. Cir. 2012) ("Where the property interest permanently taken is an easement, the 'conventional' method of valuation is the 'before-and-after' method.") (quoting United States v. Virginia Elec. & Power Co., 365 U.S. 624, 632 (1961)). This calculation includes both the value of the land taken as well as any diminution in the value of plaintiffs' property as a whole that resulted from the taking. Georgia-Pac. Corp. v. United States, 640 F.2d 328, 336 & n.4 (Ct. Cl. 1980). Plaintiffs have the burden of proof to establish the value of the property in both respects. Id. at 337; Miller v. United States, 620 F.2d 812, 828 (Ct. Cl. 1980).

Additionally, in a rails-to-trails case, "the fair market value of the land includes the physical remnants of the railway that would have remained on the landowners' property but for the issuance of the NITUs." Rasmuson v. United States, 807 F.3d 1343, 1345 (Fed. Cir. 2015). The landowner would need to remove the physical remnants of the railway to convert the land to its highest and best use, which would come at a cost to the landowner. See id. at 1346. Thus, to avoid an "artificially inflated" valuation of the land, the just compensation must include a deduction of the cost to reclaim and convert the land from its pre-NITU condition to the highest and best use. Id.; see also Childers v. United States, 116 Fed. Cl. 486, 497 (2013) ("The landowner 'is entitled to be put in as good a position pecuniarily as if his property had not been taken. He must be made whole but is not entitled to more.'") (quoting Olson, 292 U.S. at 255), recons. denied, 118 Fed. Cl. 394 (2014).

ANALYSIS

The value of the taking is assessed as of the time of the taking, see Childers, 116 Fed. Cl. at 498, i.e., the date on which the NITU was issued, see Caldwell, 391 F.3d 1233-35; Caquelin v. United States, 121 Fed. Cl. 658, 664 (2015), appeal filed, No. 16-1663 (Fed. Cir. Mar. 8, 2016). Here, the STB issued the NITU for the Iowa River Railroad corridor on August 2, 2012, Sears I, 124 Fed. Cl. at 446, setting the date for valuing the subject parcels. The major issues addressed at trial were: the value of the land underlying the right-of-way; the cost to reclaim the corridor and convert it into usable farmland; diminution in value of the subject parcels due to the creation of point rows; and whether the corridor reduced or eliminated access between the bisected sections of the subject parcels, causing further damage to the subject parcels.

I. Value of Land Taken

A. Methodology

Both plaintiffs' appraisal expert, C. David Matthews,[4] and defendant's appraisal experts, Gary Thien[5] and Patrick Schulte,[6] used a sales comparison approach to determine the value of the land underlying the right-of-way for each parcel cluster. This analysis was performed in accord with the standards set forth in the Uniform Appraisal Standards for Federal Acquisitions, commonly referred to as the "Yellow Book." See DX 1 (Interagency Land Acquisition Conference, Uniform Appraisal Standards for Federal Land Acquisitions (2000)) at 20-22; PX 11 at 6;[7] DX 4, Hardin County tab at 3; DX 5 at 1-4.[8] In a sales comparison approach, the

---

[4]Mr. Matthews has a bachelor's degree in real estate from the University of Tennessee and holds several real estate appraisal certifications and licenses. See PX 32 (Qualifications and Experience of C. David Matthews). He is the owner of David Matthews Associates, which performs real estate appraisal services for a variety of corporate and governmental clients. Tr. 262:2-23 (Matthews). The court accepted Mr. Matthews as an expert in the valuation of the rail corridor at issue in this case. Tr. 280:21 to 281:3. His expert reports evaluating the subject parcels were admitted into evidence, namely PX 11 (Matthews Appraisal Report, Gould Property); PX 12 (Matthews Appraisal Report, Bradley Property); PX 13 (Matthews Appraisal Report, Mosher Property); PX 14 (Matthews Appraisal Report, Heene Property); and PX 15 (Matthews Appraisal Report, Richards Property).

[5]Mr. Thien has a bachelor's degree in agricultural business from Iowa State University and holds several certifications and licenses in the fields of rural property appraisal and farm management. DX 4 (Expert Report of United States' Appraiser Gary Thien), Addenda tab at 283-84. He was the president of Thien Farm Management, Inc., which provides farm management and appraisal services in Iowa, Nebraska, and Missouri. Id. at 284. The court accepted Mr. Thien as an expert in rural appraisal and farm management. Tr. 759:5-8, 760:8-9. His expert report evaluating the subject parcels was admitted into evidence as DX 4.

[6]Mr. Schulte has a bachelor's degree in real estate and urban land economics from the University of Wisconsin and holds several real estate appraisal certifications and licenses. DX 5 (Expert Report of United States' Appraiser Patrick Schulte), Addendum tab at 157. He is a co-founder of Commercial Appraisers of Iowa, Inc., which performs various real estate appraisal services. Id. The court accepted Mr. Schulte as an expert in the appraisal of agricultural property in Iowa. Tr. 992:22-24. His expert report evaluating the subject parcels was admitted into evidence as DX 5.

[7]Mr. Matthews' expert reports all contain the same description of methodology for determining the value of the land underlying the right-of-way. Therefore, this opinion will only cite to the description appearing in plaintiffs' Exhibit 11.

[8]The Yellow Book sets forth the standards and methods to be applied in appraisals of land acquired by the federal government. DX 1 at 1. In conducting such appraisals, professional appraisers must follow the terms of the Yellow Book as well as the general appraisal standards

appraiser determines the per-acre value of the land in the before condition (i.e., before the taking) and applies that value to the acreage taken by the government within each parcel.

To determine the per-acre value of the land, the appraiser first determines the "highest and best use" for the entire subject property. DX 1 at 17-18. The highest and best use "must be physically possible, legally permissible, financially feasible, and must result in the highest value." Id. at 17. Here, the parties agree that the highest and best use for each parcel cluster is its historic use for agricultural crop production. PX 11 at 18-19; DX 4, Hardin County tab at 21. Next, the appraiser selects comparable sales of properties that have the same highest and best use as the subject property. DX 1 at 20. To account for fluctuating property values, comparable sales are chosen based on their proximity to the date of the taking, which in this case is August 2, 2012. DX 4, Hardin County tab at 24; Tr. 301:20-23, 302:19-22 (Matthews). Comparable sales are also chosen based on their similarity in relevant respects to the subject property, such as size, percentage of tillable land, and soil quality. See DX 10 (The Appraisal of Rural Property (2d ed. 2000)) at 234 ("The major consideration in comparable sale selection is the degree of comparability between sale properties and the subject property. The appraiser seeks sales that are representative of the probable market for the subject property. There must be a significant degree of comparability between the sale properties and the subject property in terms of their physical and economic characteristics.").

The appraiser then adjusts the sale price for each comparable sale in accord with the relevant characteristics of the subject property. PX 11 at 22; DX 5, Parcel 89-Mosher tab at 174; see also Yellow Book at 21. In this case, the appraisers considered market conditions, location, parcel size, soil quality in terms of soil type and Iowa Corn Suitability Rating ("CSR"), tillable acreage percentage, and shape and point rows. See PX 11 at 22-23; DX 5, Parcel 89-Mosher tab at 176-77. With regard to market conditions, the appraisers adjusted the comparable sales to reflect changes in agricultural land prices in Iowa over time. PX 11 at 22; DX 5, Parcel 89-Mosher tab at 176. Each comparable sale was valued as if it were sold on August 3, 2012, the day after the taking. PX 11 at 21; DX 5, Parcel 89-Mosher tab at 176.[9] No adjustments were made for location because all of the properties were "rural properties with similar influences." PX 11 at 22; see also DX 5, Parcel 89-Mosher tab at 176. Additionally, no adjustments were made for parcel size or "to reflect the impact of economies of scale," DX 5, Parcel 89-Mosher tab at 176, because "[f]armland above 40 acres typically shows no price influence from parcel size," PX 11 at 22.[10] All of the comparable sales and subject parcel clusters are larger than 40 acres. See DX 5, Parcel 77-Gould tab at Gould Replacement 13 (Gould property cluster totals

---

set forth by the Uniform Standards of Professional Appraisal Practices. Tr. 282:9-20 (Matthews).

[9]The court's prior opinions denote the date of the taking as August 2, 2012, the date of the NITU, Sears I, 124 Fed. Cl. at 446, while the parties' experts use a taking date of August 3, 2012, see, e.g., PX 11 at 21; DX 5, Parcel 89-Mosher tab at 176. The one-day difference is immaterial to determining the value of the take in this case.

[10]The court has accepted that assumption even though it is contrary to the court's own experience.

71.72 acres); DX 5, Parcel 87-Bradley tab at Bradley Replacement 15 (Bradley property cluster totals 85.07 acres); DX 5, Parcel 89-Mosher tab at 165 (Mosher property cluster totals 211.03 acres); DX 4, Parcel 91-Heene tab at 220 (Heene property cluster totals 191.33 acres); DX 5, Parcel 120-Richards tab at 319 (Richards property cluster totals 443.41 acres).

At trial, the parties presented extensive documentary evidence and testimony regarding the influence of soil quality and CSR on the value of Iowa farmland. According to the developers of CSR at Iowa State University, CSR "is an index that rates soil types based on their productivity for row-crop production. CSR values can range from a high of 100 to a low of 5 index points per acre. The higher the CSR, the more productive and more valuable is the land, assuming other relevant valuation factors are constant." DX 4, Hardin County tab at 23. CSR ratings are calculated using soil maps, which show "an aerial view of the land with lines that distinguish the boundaries between various soil types." DX 22(R) (Don Hofstrand, Understanding Iowa Corn Suitability Ratings (CSR), Iowa State University (2010)) at 2.[11] The CSR for a parcel is determined based upon the weighted average of CSR ratings for each soil type in the parcel, taking into account the total acreage per soil type. Id. at 2-3. Starting with a value of 100 for perfect land, CSR is adjusted downward based on soil type, slope of terrain, the land's susceptibility to erosion, drainage problems, and the frequency and seriousness of flooding upon the land. Id. at 2; Tr. 316:1-7, 508:12-21, 509:3-12 (Matthews).[12]

The percentage of tillable land has a significant influence on the value of agricultural land in Iowa. Non-tillable land, which includes grazing pastures, woodland, and natural waterways, is considerably less valuable than tillable land that can be used for row crops. PX 11 at 23; DX 5, Parcel 89-Mosher tab at 176. Mr. Matthews applied a rule of thumb "based upon 0.75%

[11]The underlying source of soil information for the CSR is the National Resources Conservation Service, United States Department of Agriculture. Tr. 976:5-6 (Thien). Iowa State starts with the soil data and develops the CSR after taking into account variables pertinent to agriculture in the state. Tr. 976:6-9 (Thien); Tr. 1296:18 to 1301:12 (Matthews).

[12]Testimony at trial addressed the difference between CSR and CSR2 and its effect on the valuation of the subject parcels. CSR2 is an updated index of soil quality and land suitability for crop production that accounts for the same factors as the original CSR. See PX 37 (Gerald Miller and Lee Burras, Corn Suitability Rating 2 Equation Updated (Apr. 15, 2015)). CSR2 is of limited utility to this case because it was not published until 2014 and was not adopted by Hardin County until 2015. Tr. 1059:16-18, 1060:1-3 (Schulte). The value of the subject parcels is being determined as of August 2, 2012, and the court consequently adopts the CSR values in use at that time in its analysis; that is, CSR rather than CSR2. Both plaintiffs' and defendant's experts aver that they used CSR in their adjustments to comparable sales. Tr. 679:7-10 (Matthews); Tr. 1059:14-16 (Schulte). Ultimately, however, the difference between CSR and CSR2 for the properties at issue is relatively small and would not affect the court's determination of per-acre value for each parcel cluster. See Tr. 683:24 to 684:2 (Matthews) ("Most of the CSR2 and CSR are similar in numbers for most soils. Where you run into problems are with the extreme [cases].").

adjustment per 1% difference in percent tillable." PX 11 at 23; see also Tr. 313:8-15 (Matthews).[13]

Finally, an appraisal of Iowa farmland adjusts for the shape and percentage of point rows in each comparable sale. "The row crop land areas of farm properties are more desirable when they have right angle boundaries, which allow for straight equal crop rows, providing the greatest equipment/labor/material efficiencies. If the boundaries are diagonal, or if there are waterways, terraces, or right-of-ways that require diagonal farming, this is a negative factor." DX 5, Parcel 89-Mosher tab at 177. In row-cropped fields, farmers prefer to plant in straight lines, planting so-called end-rows first, i.e., areas adjacent to the boundaries of the field, and then filling in the encompassed area by also planting in straight lines, turning at the ends of the fields at 90-degree angles to reverse course and plant adjacent to the area just planted. If the field is either subject to angles or is otherwise irregular, the large, i.e., wide, equipment used cannot be normally shut off when the first angled end-row is encountered by a portion of the planter. Planting must continue until the last angled end-row is reached, to prevent voids in the planted area. The result is essentially an overlap with a portion of the end-rows being double-planted.[14] Most planted rows are 30 inches apart, Tr. 967:16-17 (Thien), and planters in use in 2012 ranged from 12-row to 24-row versions, so the overlapping double-planted areas can be substantial.[15] The same principle of overlaps with angular point rows applies to application of fertilizer and of chemicals used for weed and pest control. Mr. Matthews assessed that each incremental 1% of point rows decreases

---

[13]Mr. Matthews used the example of woodland with no tillable acres to illustrate the adjustment:

> [T]he worst land you can find has some value. It might be worth $1,000 an acre, but typically woodland sales I've found, recreational land is about $2,500 an acre. Really good land is 10,000, so it's a 75 percent or .75 percent adjustment as you go from 100 down to 25.

Tr. 313:10-15 (Matthews).

[14]The area of overlap will depend on the width of the equipment used and the degree of the angle involved. See infra, n.16.

[15]In the over four and one-half years since the NITU was issued, the technology employed in and with agricultural equipment has advanced to the point where GPS fittings allow row-shutoffs as well as steering and guidance. Tr. 248:6-15 (Guiles). If they work properly, these shutoffs allow each individual planter head to stop planting when the GPS indicates that the particular row has reached the end-rows. In other words, the most modern equipment in use today would shut off each individual planter head of a 24-row planter at a different time upon reaching an angled set of point rows. Planting overlaps would thus be eliminated, although the same devices are not necessarily in use for application of fertilizer and chemicals. Because of the substantial capital investment required, GPS-fitted planters with row shutoffs are not used by average farmers on a current basis.

the per-acre value of the subject property by 1%, see Tr. 313:17-25 (Matthews), while defendant's appraisers' adjustments to comparable sales due to point rows varied from 0.1% to 5%, see, e.g., DX 5, Parcel 77-Gould tab at Gould Replacement 22 (0.1% to 3% adjustment for point row damages for comparable sales in the valuation of the Gould parcel cluster); DX 5, Parcel 89-Mosher tab at 177 (0.1% to 5% adjustment for point row damages for comparable sales in the valuation of the Mosher parcel cluster).[16]

After making the necessary adjustments, the appraiser should give the greatest weight to properties that are the most similar to the subject property, i.e., those that required the fewest adjustments to approximate the qualities of the subject property. DX 1 at 20; see also Tr. 766:11-12 (Thien) ("The smaller the adjustments you can make, the better off you are."). Mr. Matthews accordingly excluded the lowest and highest comparable sales figures from the per-acre price average, as well as those comparable sales that "fell outside the typical range." See PX 11 at 21; Tr. 319:14 to 320:8 (Matthews). He also rounded his final average figure up or down based on his judgment of the value of the subject land. See Tr. 320:9-22 (Matthews). On the other hand, the government's experts expressly chose as comparables those "sales that would provide a good indication of value for the property being appraised," and thus they generally gave equal weight to each adjusted per-acre sale value of their comparables. See DX 5, Parcel 77-Gould tab at Gould Replacement 19, Gould Replacement 22; Tr. 1005:21-24 (Schulte). For the Heene parcel cluster, two comparable sales deemed to be "most comparable to the subject property" were given more weight than the other comparable sales considered by Mr. Thien. DX 4, Parcel 91-Heene tab at 222. The government's appraisers also generally avoided rounding their final per-acre value determinations. Tr. 1008:11-21 (Schulte).

---

[16]The percentage of point rows is expressed as a percentage of cropland affected compared to the total tillable area of the farm. As Mr. Matthews testified:

> [P]oint rows have an effect on the end rows, as they call them, the land that abuts up against the point rows. It doesn't affect the whole farm. Just that strip along through there. And I calculate the size of that strip and based upon an area of about 75 to 100 feet [wide] that will be affected.

Tr. 313:17-23 (Matthews). Mr. Matthews typically assumed that the affected width would be 88 feet, see PX 11, Addenda at 20th unnumbered page, reflecting the approximate width a 16-row planter would require for safe operation in a field while turning, Tr. 226:23 to 227:17 (Gould). At the time of trial, August 2016, several of the affected farmers, specifically Mr. Gould and Mr. Guiles, used 24-row equipment, Tr. 220:1, 222:1-12 (Gould); 242:24 (Guiles), while the Moshers have a relatively small farm and used a 12-row planter without GPS, Tr. 206:11-12 (J. Mosher).

The sample calculation provided by Mr. Matthews regarding loss in value due to point rows, PX 11, Addenda at 20th unnumbered page, contains an error, essentially treating the affected area as being of no value rather than having diminished value.

B. Value of the Take for Each Parcel Cluster

To determine the damages to be awarded for the land taken, the court must determine (1) the size of the take from each parcel cluster, and (2) the per-acre value of each parcel cluster in its condition before the taking (i.e., as agricultural land).

First, the court credits defendant's experts' figures for the size of each taking. Whereas Mr. Matthews relied upon the areas provided to him by class counsel, see Tr. 294:22-25 (Matthews), Mr. Schulte and Mr. Thien used "public assessment software" to determine the size of each take, see DX 5, Parcel 77-Gould tab at Gould Replacement 13. The court finds that the assessment software is a more reliable source than plaintiffs' counsel, and adopts the following values for the size of the land taken within each parcel cluster:

Parcel Cluster	Land Taken
Gould	5.45 acres
Bradley	3.46 acres
Mosher	6.07 acres
Heene	10.2 acres
Richards	12.13 acres

Id. at Gould Replacement 16; DX 5, Parcel 87-Bradley tab at Bradley Replacement 19; DX 5, Parcel 89-Mosher tab at 171; DX 4, Parcel 91-Heene tab at 219; DX 5, Parcel 120-Richards tab at 324.

Next, to determine the per-acre value of each parcel, the parties adjusted the comparable sales figures to reflect a hypothetical sale of the subject property on August 3, 2012 and calculated the average per-acre value of the comparable sales. In making his adjustments to the comparable sales for each parcel cluster, Mr. Matthews used the following values for the parcel clusters in the before condition:

Parcel Cluster	Acreage	CSR	Percent Tillable	Point Rows (LF)[17]
Gould	71.02	97	100%	1100
Bradley	85.06	88	97%	2000
Mosher	210.87	56	88%	2850
Heene	190.63	73	92%	4700
Richards	443.38	67	88%	3700

PX 11 at 21; PX 12 at 21; PX 13 at 22; PX 14 at 22; PX 15 at 19. Defendant's appraisers used the following values for their equivalent assessment:

[17]Mr. Matthews used linear feet ("LF") as the primary basis for his evaluation of point rows. That linear measure was translated to an area using an assumed width and then related to the tillable portions of the relevant parcel.

Parcel Cluster	Acreage	CSR	Percent Tillable	Point Rows (%)[18]
Gould	71.72	97.5	100%	0.2%
Bradley	85.07	84.8	92.14%	0.4%
Mosher	211.03	66.4	74.3%	0.6%
Heene	191.33	79.6	98.23%	N/A
Richards	443.41	65	86.6%	0.4%

DX 5, Parcel 77-Gould tab at Gould Replacement 13, 15-16, 20; DX 5, Parcel 87-Bradley tab at Bradley Replacement 15, 18-19, 23; DX 5, Parcel 89-Mosher tab at 165, 170-71, 175; DX 4, Parcel 91-Heene tab at 220; DX 5, Parcel 120-Richards tab at 319, 323-25, 328. Defendant's appraisers also separately accounted for the percentage of the parcels susceptible to flooding in adjusting their comparable sales figures. See, e.g., DX 5, Parcel 120-Richards tab at 328 (including an adjustment for the fact that 8.6% of the Richards property is in a flood hazard zone). As explained previously, however, CSR includes an assessment of flood susceptibility, so this additional adjustment was unnecessary.

For the Gould parcel cluster, the government's "before" per-acre value from Mr. Schulte was $11,745, and Mr. Matthews' appraisal was $10,500 per acre. DX 5, Parcel 77-Gould tab at Gould Replacement 22; PX 11 at 21. This cluster has a near-perfect CSR rating and is 100% tillable, both of which merit a high per-acre value for the land taken. The government's value is $1,245 greater than the value calculated by plaintiff's expert, Mr. Matthews. Notably fewer adjustments were necessary for Mr. Schulte's chosen comparable sales than for Mr. Matthews' comparable sales. A smaller number of adjustments indicates a greater similarity between the comparable sales and the subject parcel, which renders the analysis more reliable. See DX 10 at 235-36 ("The most dependable conclusions [in a comparable sales analysis] are based on comparisons of the most similar factors and conditions."). Specifically, Mr. Schulte made an average absolute adjustment[19] to the Gould comparable sales of 7.28%, whereas Mr. Matthews' average absolute adjustment was 17.55%. See DX 5, Parcel 77-Gould tab at Gould Replacement 20; PX 11 at 21. Thus, the court concludes that Mr. Schulte's analysis of comparable sales for the Gould property is more appropriate and adopts his per-acre value determination.

For the Bradley parcel cluster, the government's "before" per-acre value per Mr. Schulte was $9,869, and Mr. Matthews' value was $9,300 per acre. DX 5, Parcel 87-Bradley tab at Bradley Replacement 25, PX 12 at 21. Similar to the Gould cluster, Mr. Matthews made extensive adjustments to his comparable sales for the Bradley cluster, indicating that the chosen group of sales was not a fully appropriate fit for determining the per-acre value of that property. Although Mr. Schulte's five chosen comparable sales were also all used by Mr. Matthews, Mr. Schulte selected the sales that were a closer fit in terms of land size and CSR rating, specifically

[18]Defendant's experts used a comparable area affected by point rows, i.e., linear feet of point rows with a 30-feet width assumption, divided by the overall tillable area of the pertinent parcel.

[19]To determine average absolute adjustment, the court averaged the absolute value of the percentage adjustment made by the appraisers to each comparable sale.

comparable sales nos. 203 and 205. See DX 5, Parcel 87-Bradley tab at Bradley Replacement 23. As such, Mr. Schulte made an average absolute adjustment to the Bradley comparable sales of 9.86%, whereas Mr. Matthews' average absolute adjustment was 16%. See id.; PX 12 at 21. Thus, the court concludes that Mr. Schulte's analysis of comparable sales for the Bradley property is more appropriate and adopts his per-acre value determination.

For the Mosher parcel cluster, the government's "before" per-acre value per Mr. Schulte was $5,344, and Mr. Matthews' value was $5,600 per acre. DX 5, Parcel 89-Mosher tab at 177; PX 13 at 35. The Mosher cluster is somewhat unusual because of its relatively low CSR rating and somewhat sizeable acreage, which means that there are fewer directly comparable sales in the region.[20] Perhaps for this reason, both Mr. Schulte's and Mr. Matthews' comparable sales required significant adjustments. All of Mr. Matthews' comparable sales required absolute adjustments ranging from 32% to 75%, with the majority of the adjustments (22% to 40%) stemming from adjusting high CSR ratings to reflect the Mosher cluster's lower rating. This led to an average absolute adjustment of 45.73%, compared to an average absolute adjustment for the properties evaluated by Mr. Schulte of 23.18%. PX 13 at 22; DX 5, Parcel 89-Mosher tab at 175. Even though Mr. Schulte's comparable sales for the Mosher cluster are less similar to the subject parcel and required more adjustments than his comparable sales for the other properties considered at trial, the court finds that, given the unusual characteristics of the Mosher cluster, he chose appropriate comparable sales that needed fewer adjustments under the circumstances. Thus, the court adopts Mr. Schulte's per-acre value determination for the Mosher property.

For the Heene parcel cluster, the government's "before" per-acre value from Mr. Thien was $8,156,[21] and Mr. Matthews' value was $7,500 per acre. DX 4, Parcel 91-Heene tab at 222; PX 14 at 22. Mr. Matthews' comparable sales required significant adjustments for this parcel cluster as well, see PX 14 at 22, whereas Mr. Thien chose parcels that were more similar to the Heene property (particularly with regard to CSR rating) and therefore required fewer adjustments, see Tr. 765:4-5 (Thien). Specifically, Mr. Matthews' comparable sales for the Heene cluster required an average absolute adjustment of 27.55%, whereas Mr. Thien's comparable sales required an average absolute adjustment of 6.92%. PX 14 at 22; DX 4, Parcel

[20]By describing the Mosher parcel cluster's CSR rating as "relatively low," the court does not mean to indicate or suggest that the Mosher lands are not productive. As a general matter, the locale involved in this case includes some of the most productive agricultural land in Iowa, and thus in the United States, and the descriptive term used reflects a comparison to the other properties addressed at trial.

[21]Mr. Thien's expert report estimates the total value of the Heene property in the before condition as well as the per-acre value when including the cost to cure. DX 4, Parcel No. 91-Heene tab at 222. The court calculated the per-acre value in the before condition exclusive of the cost to cure by dividing the total value of the parcel by 191.33 acres, the size of the property in the before condition.

No. 91-Heene tab at 220.[22] The court thus adopts Mr. Thien's comparable sales analysis and per-acre value determination for the Heene property.

For the Richards parcel cluster, the government's "before" per-acre value from Mr. Schulte was $7,544 while Mr. Matthews' appraised value was $6,450 per acre. DX 5, Parcel 120-Richards tab at 330; PX 15 at 19. Due to the large size and relatively low CSR of the Richards cluster, there were few comparable sales of similar size and CSR rating. Although both Mr. Matthews and Mr. Schulte used comparable sales of parcels much smaller than the Richards cluster, Mr. Schulte selected comparable sales that had similar CSR ratings to the Richards cluster while Mr. Matthews selected sales with higher CSR values. See DX 5, Parcel 120-Richards tab at 328; PX 15 at 19. Consequently, Mr. Matthews' comparable sales required an average absolute adjustment of 37.91%, while Mr. Schulte's comparable sales had an average absolute adjustment of 16.55%. See DX 5, Parcel 120-Richards tab at 328; PX 15 at 19. Mr. Schulte's chosen comparable sales were more similar to the Richards parcel, and thus his analysis is more reliable. The court therefore adopts Mr. Schulte's per-acre value determination for the Richards parcel cluster.

In sum, the court awards damages to plaintiffs for the value of the land taken by the government as follows:

Parcel Cluster	Area Taken	Value of Land Taken
Gould	5.45 acres	$64,010.25
Bradley	3.46 acres	$34,146.74
Mosher	6.07 acres	$32,438.08
Heene	10.2 acres	$83,191.20
Richards	12.13 acres	$91,508.72

II. Cost to Reclaim

The court must determine the cost to reclaim the land, with that cost to be deducted from the value of the land taken. See Rasmuson, 807 F.3d at 1345-46. The cost to reclaim is calculated as the cost to convert the right-of-way to the highest and best use of the land. Tr. 322:22 to 323:1 (Matthews). Here, the landowners would most likely seek to reclaim as much of the land as possible and convert it back to its highest and best use as crop-producing land. See, e.g., Tr. 220:8-11 (Gould) (explaining that Mr. Gould would reclaim the land underlying the right-of-way "in a heartbeat" if given the opportunity to do so); Tr. 245:2-13 (Guiles) (explaining that he would want to reclaim all of the land underlying the right-of-way on the Heene property because it would increase the value of the land, make it easier to farm, and prevent flooding); Tr. 1101:24 to 1102:3 (Schulte) (explaining the assumption in the appraisals that a typical buyer would reclaim as much land as possible, excepting only areas that could not be feasibly reclaimed, such as wetlands, waterways, and heavily wooded areas). The reclamation

[22]Mr. Thien's expert report lists the dollar value adjustment for each element for each comparable sale. See DX 4, Parcel 91-Heene tab at 220. The court calculated the percentage adjustment for each comparable sale by dividing the total dollar value adjustment by the original price per acre.

calculations in this case assume that the rails and ties have been removed from the right-of-way, which circumstance was evident from the site visits, but that other remnants of the railbed remain, which must be taken into account to convert the land back to use as farmland. See Tr. 323:4-12 (Matthews). In this case, those remnants include the ballast from the railbed,[23] earthen fills, and trees and vegetation, which would have to be removed, and the area thus prepared would have to be leveled and graded to adapt the right-of-way to the adjacent tillable portions of the property. See Tr. 775:18 to 776:5 (Thien).

A. Methodology

In determining cost to reclaim, Mr. Matthews first assessed how much of the right-of-way could be reclaimed "based upon topography and vegetation." PX 11 at 23. The reclaimable acreage of the right-of-way was then evaluated for the estimated costs of grading and tree removal. Id. at 21. Mr. Matthews valued tree and vegetation removal at $2,000 per acre, and he valued grading at $115 per acre for filling and grading ditches at the sides of the right-of-way and $25 per acre for chisel plowing. Id.; PX 14 at 22. He did not include a cost for ballast removal because he considered that the value of ballast to the landowner for use on the farm was approximately equal to the cost to remove the ballast from the right-of-way and move it elsewhere. Tr. 323:24 to 324:4 (Matthews). According to Mr. Matthews:

> I've asked . . . many farmers, and they say they could reuse this ballast for roads, for filling ditches, for erosion spots or whatever. It's not worth anything, though, as the cost to remove it and then move it someplace else and dump it is about the same cost if you hired somebody to come in and do it. So it's kind of a wash, doesn't add, doesn't subtract. It's reusable stuff.

Tr. 120:4-12 (Matthews). Using this methodology, Mr. Matthews determined the cost to reclaim per acre and multiplied it by the size of the reclaimable area. He then rounded up this cost estimate "to cover any contingencies or things [he] might have missed." Tr. 327:19-22 (Matthews).

Defendant's appraisers used a similar approach to determine cost to reclaim. Mr. Schulte and Mr. Thien both first determined how much of the right-of-way could be reclaimed. See DX 4, Hardin County tab at 22; DX 5, Parcel 77-Gould tab at Gould Replacement 14. Next, they calculated the cost of earthwork and tree removal for each parcel. DX 4, Hardin County tab at 22; DX 5, Parcel 77-Gould tab at Gould Replacement 14. Earthwork, which includes ballast removal, dirt removal or relocation, and grading of the land, DX 5, Parcel 77-Gould tab at Gould Replacement 14; Tr. 775:18 to 776:20 (Thien), was deemed to cost $1 per cubic yard of material moved, DX 4, Hardin County tab at 22; DX 5, Parcel 77-Gould tab at Gould Replacement 14. To determine the "total volume of earth movement" necessary for each parcel cluster, the appraisers determined the length of the reclaimable right-of-way and used light detection and ranging ("LIDAR") mapping to assess the elevation of each railbed as compared to the land surrounding it. DX 4, Hardin County tab at 22; see also DX 5, Parcel 77-Gould tab at Gould

[23]Ballast is the crushed rock or stone that was used by the railroad company to stabilize the railbed after primary preparation of the bed by cuts and fills. See Tr. 323:6-10 (Matthews).

Replacement 14. Additionally, tree removal was valued at $130 per hour of work needed, a value that was determined based on discussions with contractors. See DX 4, Hardin County tab at 22; Tr. 915:4-6 (Thien).

Both parties' methodologies have weaknesses. First, Mr. Matthews should have included the cost to remove the ballast from the right-of-way in his calculation of cost to reclaim. Although the ballast may have value to the landowner, the landowner would still incur a cost to remove it from the right-of-way and shift it to a location elsewhere on the property using equipment such as bulldozers and trackhoes. See Tr. 776:17-20 (Thien). Mr. Schulte and Mr. Thien accounted for ballast removal in their cost per cubic yard for earthwork, and that approach provides an appropriate basis to determine the cost of ballast removal and grading. Accordingly, Mr. Matthews' use of "minor grading" of the side areas adjoining the ballast area, see PX 11 at 21, is surplusage because that work is taken into account in the earthwork cost.

Contrastingly, Mr. Schulte and Mr. Thien did not sufficiently account for the cost of tree removal in their assessments, primarily because they omitted a number of tree-covered areas of the right-of-way bordering the railbed from their assessment of the land to be reclaimed. The landowners, however, uniformly and repeatedly stated that they would recover as much of the right-of-way as possible, even if they would incur costs to do so, as discussed supra. In light of this evidence, the court adopts Mr. Matthews' assessment of tree removal costs for each parcel that required such removal as part of reclamation. And, in that same vein, the court also adopts Mr. Matthews' acreage determinations for the size of the areas to be reclaimed and thus subject to ballast removal and grading because he accounted for a larger portion of the right-of-way as reclaimable land for each parcel. As Mr. Matthews did not account for the elevation of the right-of-way, however, the court adopts the LIDAR elevation figures used by the government to gauge the extent of ballast removal and earthwork.

B. Estimated Cost to Reclaim for Each Parcel Cluster

For the Gould parcel cluster, the landowner would need to remove ballast from the entire right-of-way and grade and level the resulting area, all of which is reclaimable. Tr. 1116:19-22 (Schulte). The affected area is 70,550 square feet in size. PX 11 at 21. According to the LIDAR maps used by Mr. Schulte, the railroad center line is elevated above the grade of the surrounding fields at various heights between 0 feet and 5 feet, with an average elevation of 2 feet. DX 5, Parcel 77-Gould tab at Gould Replacement 14. As such, approximately 141,100 cubic feet, or 5,225.9 cubic yards, of ballast would need to be moved before the remaining earth is graded and leveled. Some of the ballast could be shifted into small side ditches and regraded, while the rest would need to be moved elsewhere. Tr. 325:24 to 326:4 (Matthews). Assuming a cost of $1 per cubic yard, this process would cost $5,225.90. The reclaimable land in the Gould cluster does not have trees that would require removal, see PX 11 at 21; Tr. 1158:19-23 (Schulte), so the total cost to reclaim for this cluster is $5,225.90.

For the Bradley parcel cluster, the landowner would need to remove 3 cubic yards of ballast for every linear foot of the right-of-way, as well as level and grade that land. DX 5, Parcel 87-Bradley tab at Bradley Replacement 18. In making this assessment, Mr. Schulte used the LIDAR mapping of the Bradley property, which showed an average elevation of 3 feet, and

he relied on the assumption that "the top of the former railbed [is] 12 [feet] wide, and the triangle side slopes . . . extend 15 [feet] on either side of the former railbed edge." Id. The right-of-way on the Bradley property is 1,500 feet long. PX 12 at 21. As such, 4,500 cubic yards of ballast would need to removed and leveled at a cost of $4,500. Additionally, the affected land has 1.5 acres covered by medium-density trees. Id. The cost to remove these trees at $2,000 per acre would total $3,000. Id. In sum, the total cost to reclaim the Bradley parcel cluster would be $7,500.

For the Mosher parcel cluster, the landowner would reclaim as much of the land as possible, not just to recover productive farmland but also to eliminate harm to the adjoining fields caused by the railbed. See Tr. 151:6 to 152:12 (N. Mosher and J. Mosher) (explaining that the railroad right-of-way acts as a levee and prevents drainage, and that reclaiming the right-of-way by grading the area with a bulldozer would improve drainage on the fields "immensely"). The area involved totals 33,000 square feet. PX 13 at 22. The LIDAR maps used by Mr. Schulte show that most of the railroad center line (1,780 linear feet) is elevated between 0 feet and 3 feet, see DX 5, Parcel 89-Mosher tab at 169, so the court assumes an average elevation of 1.5 feet. A northerly portion of the right-of-way corridor is elevated 6 to 10 feet above field grade, however. Id. at 168. The length of that northerly segment is approximately 420 linear feet. Id. A southerly portion of the railbed is located along timber approaching a trestle and is elevated between 5 and 12 feet above field grade. Id. That area, approximately 350 feet in length, would not be reclaimed. See PX 13 at 22; DX 5, Parcel 89-Mosher tab at 168.[24] Therefore, approximately 90,450 cubic feet, or 3,350 cubic yards, of ballast would need to be moved and leveled on the reclaimable land at a cost of $3,350.00. Mr. Matthews also identified that there is a 0.25 acre section of the Mosher property that contains small bushes and trees that would need to be removed. PX 13 at 22; Tr. 405:20-23 (Matthews). The cost to remove the trees and bushes would total $500. PX 13 at 22. In sum, the total cost to reclaim the right-of-way on the Mosher property would be $3,850.00.

For the Heene parcel cluster, the landowner would need to remove 180 cubic feet, or 6.67 cubic yards, of ballast and earth for every linear foot of the right-of-way, and then level and grade that land. DX 4, 2016 Report Amendment tab at 13. This figure is based on the height of the railbed being approximately 6 feet above the surrounding land, about 12 feet wide, and having "3 to 1 side slopes." Id. The reclaimable corridor on the Heene property is 4,100 feet long. PX 14 at 22.[25] Therefore, 27,333.33 cubic yards of ballast would need to removed and

[24]The unreclaimable area of the Mosher property is approximately 33,000 square feet. PX 13 at 22; see also Tr. 405:1-8 (Matthews) (explaining that the south end of the right-of-way on the Mosher cluster cannot be reclaimed because "it's so high in elevation above the adjacent land [that a landowner] could never afford to clear all that, so that's where the cattle cross and the land falls off into the Dow Creek."); Tr. 139:19 to 142:23 (N. Mosher and J. Mosher) (describing that a stream runs under a trestle within the right-of-way area on the Mosher property, and that cows pass under the trestle to graze).

[25]The Heene property also contains an unreclaimable section of the right-of-way equaling 110,000 square feet. PX 14 at 22; see also Tr. 416:3-7 (Matthews) (explaining that this portion of the right-of-way cannot be reclaimed because of dense trees and low elevation).

leveled at a cost of $27,333.33. In addition, 5.37 acres of the property contain medium-density trees that would need to be removed to reclaim the land. PX 14 at 22. The cost to remove those trees at $2,000 per acre would total $10,740. Id. In sum, the total cost to reclaim the right-of-way on the Heene property would be $38,073.33.

For the Richards parcel cluster, the landowner would need to remove 135 cubic feet, or 5 cubic yards, of ballast for every linear foot of the right-of-way, as well as level and grade that land. DX 5, Parcel 120-Richards tab at 323. Mr. Schulte determined this volume based on the LIDAR mapping of the Richards property, which showed an average elevation of 5 feet, and on the assumption that "the top of the former railbed [is] 12 [feet] wide, and the triangle side slopes . . . extend 15 [feet] on either side of the former railbed edge." Id. The right-of-way on the Richards property is 5,400 feet long. PX 15 at 19.[26] Therefore, 27,000 cubic yards of ballast would need to be moved and leveled at a cost of $27,000. Some of the ballast could be pushed into ditches and buried, or could be moved elsewhere on the land to be used for another purpose. See Tr. 120:25 to 121:2 (Matthews). In addition, 2 acres of the land contain medium-density trees that would need to be removed at a cost of $4,000. PX 15 at 19. In sum, the total cost to reclaim the right-of-way on the Richards property would be $31,000.

The following chart summarizes the cost to reclaim for each parcel cluster. These amounts shall be deducted from the assessed value of the land taken for each cluster.

Parcel Cluster	Cost to Reclaim
Gould	$5,225.90
Bradley	$7,500.00
Mosher	$3,850.00
Heene	$38,073.33
Richards	$31,000.00

III. Point Row Damages

Point rows are the "result of inefficiencies in the farming process caused by small angles that are created when large farm implements turn on a diagonal as opposed to farming a purely rectangular or square parcel of ground." Pls.' Post-Trial Br. at 12. In this case, point rows are created by the right-of-way bisecting plaintiffs' typically square or rectangular fields at an angle. See, e.g., Tr. 330:10-16 (Matthews) (explaining that the right-of-way severed the Gould property into multiple fields, creating "substantial point rows [and] triangulated fields"). The addition of point rows causes row cropland to diminish in value because point rows are "more difficult, less efficient and more time consuming to farm" than square or rectangular fields. PX 11 at 30; see also Tr. 1181:15 to 1182:1 (Schulte) (explaining that point rows lead to additional time, effort, and materials spent by the farmer, lost productivity, and lost land stemming from low

[26] A portion of the Richards property cannot be reclaimed because it is elevated over a wetland and standing water. See Tr. 116:14-16, 1101:14-22 (Schulte). The Richards property also contains an unreclaimable area where a trestle carried trains over a small stream. See Tr. 1107:13 to 1108:12 (Schulte).

productivity). Farm equipment used on the type of parcels at issue in this case is generally 16 to 24 rows wide, with each row measuring approximately 30 inches. See supra, at 8-9 & nn.15-16. On a square or rectangular field, the equipment can turn at a perpendicular end row, and plant and fertilize the field evenly without overlaps. Tr. 331:22 to 332:1 (Matthews). With the presence of point rows, however, the equipment must turn with overlaps on the angle, leading to duplicate planting, fertilizing, and application of chemicals on end rows, because those areas of the field approaching the end rows otherwise would be missed by the equipment entirely. See Tr. 221:1-17 (Gould); Tr. 242:20 to 243:3 (Guiles); see supra, at 8. This leads to additional costs for the landowner without any return. See Tr. 780:17-19 (Thien) ("[P]oint rows cost the operator extra money and [they] also result[] in reduced income because of overplanting."). For environmental as well as economic reasons, farmers also endeavor to limit application of fertilizer and chemicals to no more than the amount necessary to avoid pollution attributable to rainfall runoff.[27] Point rows thus reduce the value of the land as compared to a square or rectangular tract with similar qualities. Here, the damage caused by point rows is "not curable as long as the trail is in place." PX 11 at 30.[28]

Creation of point rows by the right-of-way diminishes the value of the surrounding land and constitutes a form of severance damages. As the Yellow Book advises when a partial taking occurs, severance damages are particularly relevant in a situation like the one at hand:

> When the United States acquires only part of a unitary holding, federal law requires that compensation be made not only for the property interest acquired, but also for the diminution, if any, in the value of the remainder directly caused by the acquisition and/or by the use to which the part acquired will be put. This diminution in the value of the remainder is often and 'somewhat loosely' referred to as severance damage.

---

[27]In 2012, farm machinery used in the area was not equipped with variable row technology that eliminates the double application of crop inputs and double planting of the crop. Tr. 302:11-12 (Matthews); Tr. 228:1-8 (Gould). Variable row technology depends on a specific application of GPS to planting and fertilizing equipment and is just now coming into use by sophisticated farmers able to afford the capital investment required. Tr. 228:4-8 (Gould); see supra, at 8 n.15.

[28]For purposes of his analysis, Mr. Thien stated that "the area of overlap [due to point rows] will be calculated based on the angle of the point rows and based upon machinery width of 30 feet, although much of the fertilizer and chemical application will be done with equipment much larger." DX 4, Hardin County tab at 46. That calculation of overlap used a width that was notably too small, given the width of the 16-row and 24-row equipment being used in the area. See supra, at 8-9 nn.15-16. Mr. Thien correctly indicated, however, that a decrease in crop yield results from double planting and consequent plant overpopulation. DX 4, Hardin County tab at 46. He stated that "[o]ur experience in farm management on an actual double plant situation showed that on corn there was a 52% decrease [in yield] because of overplanting." Id. The same degree of yield reduction did not typically occur with soybeans because "soybeans will produce fewer pods per plant but there will be many more plants." Id.

Yellow Book, § B-11, at 47 (footnotes omitted) (emphasis in original) (citing Miller, 317 U.S. at 376; United States v. Grizzard, 219 U.S. 180, 183 (1911); Bauman v. Ross, 167 U.S. 548, 574 (1897)).

A. Methodology

The parties' appraisers used different methodologies to address whether and to what extent point rows would affect the value of farmland angularly bisected by a trail. The approaches taken begin with much of the same valuation data as a starting place and endeavor to reach the same end point, but diverge considerably in the use of the data and the result obtained.

Mr. Matthews used a comparable sales approach to determine the effect of point rows on the per-acre price of the subject parcel clusters. In his approach, Mr. Matthews used historical land sales listed in the Iowa Land Sales Report. PX 11, Addenda at 16th unnumbered page. He paired six irregularly-shaped parcel sales (i.e., those with point rows) with square or rectangular parcel sales that were otherwise similar in terms of location, date of sale, size, and CSR. Id. As in his comparable sales analysis for determining the value of the subject parcels, Mr. Matthews then adjusted the price of the parcels to equalize them for all factors other than point rows. Id. As such, "[t]he remaining difference in price is the indicated effect on value of the irregular shape." Id. This value could then be "converted to a [percent] loss per linea[r] foot, per percent of the whole farm[,] or a percent of the value of the acreage directly affected by the irregular shape." Id.

Once he determined the price and percentage difference between the sales with point rows and those without point rows, Mr. Matthews determined the percentage of value lost per acre for every additional percentage of point rows on the property relative to the land as a whole. To determine the acreage affected by point rows on each paired sale, Mr. Matthews multiplied the linear feet of point rows on the property by an 88 foot width, reflecting the average turning radius of 16-row equipment. See PX 11, Addenda at 10th unnumbered page; Tr. 343:10-23 (Matthews). He then used the point-row acreage figures to determine the percentage of the property affected by point rows. See PX 11, Addenda at 10th unnumbered page. Finally, he divided the percentage difference in price between the paired sales by the percentage difference in acreage affected by point rows to determine the percentage of value lost per percent acreage of point rows. See id.

After throwing out one paired sales study for calculation errors, see Tr. 699:3-22 (Matthews), Mr. Matthews analyzed the remaining five studies and determined that point rows affect price in a one-to-one relationship, meaning that for every additional 1% of land affected by point rows the price per acre will be 1% lower, Tr. 344:13-17 (Matthews). The price reduction in the paired sales studies ranged from 0.6% to 2% per additional 1% of point rows, so Mr. Matthews made a "judgment call" in selecting the one-to-one relationship. Tr. 351:13-19 (Matthews). Mr. Matthews then used the 1% diminution in value per 1% of additional point rows to calculate the per-acre diminution in value, and arrived at his damages figure by applying the per-acre diminution value to the size of the parcel in the after condition (i.e., its size in the before condition less the take). See PX 11 at 32.

Defendant's appraisers, on the other hand, performed both a multiple field study and a regression analysis to determine the effect of point rows on per-acre value. The multiple field study, described as a "paired sale analysis in bulk," Tr. 748:18 (Thien), placed 50 farm sales (30 in Marshall County and 20 in Hardin County) into three categories: regular/rectangular parcels without point rows, irregular field parcels, and irregular field parcels with three or more fields, DX 4, Hardin County tab at 32. Mr. Thien then assessed the property value per CSR point, and compared the value of the regular and irregular shaped fields at different CSR productivity ranges. Id. at 32, 35. From this analysis, Mr. Thien concluded that there was not a "quantifiable relationship between parcel price and point rows." Id. at 36.

Mr. Schulte's regression analysis used 45 agricultural land sales in Marshall and Hardin Counties that occurred between 2011 and 2013. DX 4, Hardin County tab at 41.[29] As in Mr. Matthews' analysis, Mr. Schulte adjusted the price of the parcels to isolate the impact of point rows on price. Id. at 42-44. He then determined the percentage of acres affected by point rows using the total linear feet of point rows on the land and assuming a 30-foot width as the turning radius for farm equipment. See id. at 45; Tr. 786:11-12 (Thien); Tr. 1135:8-11 (Schulte). He plotted each sale with percent of the farm impacted by point rows as the independent variable and adjusted sale price per acre as the dependent variable, and used regression analysis to derive the best-fit line. DX 4, Hardin County tab at 45. This analysis showed that each additional 1% of a parcel affected by point rows led to a 3.14% decrease in sale price. See Tr. 1202:9 to 1203:19, 1210:3-9 (Schulte). Based on the coefficient of determination, or R-squared value, produced by the regression analysis, however, defendant's appraisers deemed that there was not a statistically significant relationship between sale price and acreage affected by point rows. DX 4, Hardin County tab at 45-46; Tr. 1137:13 to 1138:2 (Schulte).

The court finds that point rows would adversely affect the value per acre of the subject parcels. Defendant's assertion that the impact is not statistically significant is misplaced. Statistical significance is measured on the basis of a confidence interval, and defendant's experts' conclusion that "the negative effect on parcel value caused by the addition of point rows cannot be accurately measured with regression analysis" occurs because the diminution in value is too small to be addressed by their statistical methodology, given the sample size used in their analysis. See DX 4, Hardin County tab at 38. For agricultural land in Hardin and Marshall Counties, defendant's experts nonetheless calculated that there is a 3.14% decrease in sale price per acre for each additional 1% of a parcel affected by point rows. Based on the sample size of their study and its reliance on data derived directly from the relevant counties, Hardin and Marshall Counties, the court deems the general relationship showing a decreased value to be a reasonable reflection of the effect of point rows on the per-acre sale price for the subject parcels. However, the court finds that a 3.14% per-acre price decrease per percentage of land affected by point rows overestimates the effect of point rows on land sale price. A 1:1 relationship (that is, a 1% decrease in price per acre for every additional 1% of point rows) effectively treats the land affected by point rows as valueless when compared to a similarly situated square or rectangular parcel, and a relationship greater than 1:1 (such as the calculation by defendant's experts of

[29]Additional sales "that required large adjustments for factors unrelated to point rows," specifically for tillable land and flood hazard zone, were excluded from the regression analysis. DX 4, Hardin County tab at 42.

3.14:1) effectively treats such land as having negative value, such that a squared-off parcel with the point rows removed would be more valuable than the full parcel with the point rows included, even though the full parcel contains more tillable acreage. As explained previously, see supra, at 9 n.16, 17-18, point rows diminish the value of land but do not render it without value. Therefore, when applying a point-row detriment across an entire parcel of land, the detriment must be less than 1% per additional 1% of point rows.[30]

Taking into account Mr. Matthews' range of results from his paired studies, see supra, at 19, and Mr. Thien's determination that double planting due to point rows would reduce corn yield by 52% and would not appreciably affect soybean yield, see supra, at 18 n.28, the court concludes and finds that a point-row detriment of 45 percent for each portion of a parcel cluster affected by point rows is the most reasonable measure of the severance damages for this factor. This assessment takes into account both the diminution in corn yield and the excess seed, fertilizer, and chemicals applied in the affected areas, whether planted with corn or soybeans. Further, the court adopts plaintiff's determination of the increase in linear feet of point rows on the land due to the taking, and uses an 88-foot width to determine affected acreage.

To arrive at the amount of severance damages from point rows, the court applies the per-acre diminution in value to the acreage affected by the point rows after the taking. As the court adopted defendant's appraisers' figures for the size of the taking, see supra, at 10, it also adopts their figures for the size of the parcel clusters in the after condition (i.e., the size of the full parcel less the size of the take). The sale price is based on the value of land taken per acre, as determined in Section I of this opinion.

B. Diminution in Value Due to Point Rows

The Gould parcel cluster has 3,000 additional linear feet of point rows due to the right-of-way, which equals 6.06 affected acres. PX 11 at 29-30; Tr. 352:5-7 (Matthews). Assuming a per-acre value of $11,745, damages to the property due to point rows total $32,028.62.

The Bradley parcel cluster has 2,400 additional linear feet of point rows due to the right-of-way, which equals 4.85 affected acres. PX 12 at 29-30; Tr. 391:19 to 392:6 (Matthews). Assuming a per-acre acre value of $9,869, total damages due to point rows are $21,539.09.

The Mosher parcel cluster has 4,000 additional linear feet of point rows due to the right-of-way, which equals 8.08 affected acres. PX 13 at 22, 31-32. Assuming a per-acre value of $5,344, total damages due to point rows equal $19,430.78.

[30]Thus, the court grants in part the government's motion for reconsideration to avoid any result that would consider the area affected by point rows to be without value, or nearly so. The court accordingly has redetermined the amount of reduction in value due to point rows, as set out infra, and has revised its calculation of point-row severance damages from that stated in its initial decision.

The Heene parcel cluster has 4,000 additional linear feet of point rows due to the right-of-way, which equals 8.08 affected acres. PX 14 at 31-32; Tr. 417:10-13 (Matthews). Assuming a per-acre value of $8,156, point row damages total $29,655.22.

The Richards parcel cluster has 9,400 additional linear feet of point rows due to the right-of-way, which equals 18.99 acres. PX 15 at 19, 27-28. Assuming a per-acre value of $7,544, point row damages for this cluster total $64,467.25.

The following chart summarizes the point row damages that shall be awarded to each plaintiff in addition to the value of the land taken.

Parcel Cluster	Point Row Damages
Gould	$32,028.62
Bradley	$21,539.09
Mosher	$19,430.78
Heene	$29,655.22
Richards	$64,467.25

IV. Access

Plaintiffs assert that they are entitled to access damages because portions of four of the parcel clusters[31] would be landlocked if crossing the right-of-way were not permitted. See Pls.' Post-Trial Br. at 22-23. If used for railroad purposes, Iowa law guarantees access over the right-of-way to the landowners. Iowa Code § 327G.11 provides:

> When a person owns farmland on both sides of a railway, or when a railway runs parallel with a public highway thereby separating a farm from such highway, the corporation owning or operating the railway, on request of the owner of the farmland, shall construct and maintain a safe and adequate farm crossing or roadway across the railway and right-of-way at such reasonable place as the owner of the farmland may designate. A private farm crossing established or installed pursuant to this section shall be used solely for farming or agricultural purposes.

In Iowa, "[t]he right to cross from one piece of land to the other, divided by the railroad track, is an absolute right given the landowner, and the duty is imposed upon the [railway] company to furnish him an adequate means for so doing." *O'Malley v. Chicago, M. & St. P*. Ry. Co., 165 N.W. 1002, 1004 (Iowa 1918). Therefore, while the Iowa River Railroad was still running over plaintiffs' land, plaintiffs had an absolute right to cross, and it was the responsibility of the railroad to maintain safe crossings for people and farm equipment to get from one side of the parcel to the other.

[31]The Gould, Bradley, Mosher, and Heene parcel clusters purportedly present access issues. The Richards parcel cluster does not.

Pursuant to Iowa Code § 327G.81, this right continued when the trail operators in Hardin and Marshall Counties, i.e., the Hardin County Trails Commission and TRAILS, Inc. respectively, took control of the right-of-way. Iowa Code § 327G.81 provides in relevant part:

> A person, including a state agency or political subdivision of the state, who acquires a railroad right-of-way after July 1, 1979, for a purpose other than farming has all of the following responsibilities concerning that right-of-way: a. Construction, maintenance, and repair of the fence on each side of the property, however, this requirement may be waived by a written agreement with the adjoining landowner. b. Private crossings as provided for in section 327G.11. c. Drainage as delineated in chapter 468, subchapter V. d. Overhead, underground, or multiple crossings in accord with section 327G.12. e. Weed control in accord with chapter 317.

Iowa Code § 327G.81(1). In short, the trail operator succeeds to the obligations of the railroad, which include the maintenance of private crossings and guaranteed access, and these statutory provisions continue to apply to the Iowa River Railroad corridor now that the trail operators control the right-of-way. Thus, pursuant to Iowa Code §§ 327G.11 and 327G.81, the trail operators must provide access to the landowners over the right-of-way, and the operators have a statutory duty to maintain the crossings in a safe and adequate manner. Plaintiffs therefore have not lost access, as they contend, but rather have had no change in their access rights.

Plaintiffs' actual use of the crossings along the right-of-way belies their contention that they have lost access. Plaintiffs continuously farmed the land on both sides of the right-of-way while trains were still running, and they have continued to do so during the development of the trail without any impediment from the trail operators. Tr. 144:6-22 (J. Mosher); see also Tr. 210:1-2 (J. Mosher) ("At this point in time of the year I'm crossing it daily [with farm equipment]."); Tr. 230:2 to 231:5 (Gould) (explaining that he was never impeded from using the crossing for farming purposes when the railroad owned the crossing or when ownership changed to the trail operator, and that he has used the crossing continuously as long as he has owned the property); Tr. 251:2 to 252:12 (Guiles) (stating that no entity has prevented crossing over the right-of-way with regard to the Heene property). Further, the Hardin County Trails Commission and TRAILS, Inc. have not denied or attempted to deny access over the trail to farmers whose property is bisected by the right-of-way, and have no plan to deny access if asked by the farmers. Tr. 1255:4-21 (Test. of Christopher Wieting, Chair of the Hardin County Trails Commission); Tr. 1286:8 to 1287:20 (Test. of Terrence L. Briggs, President of TRAILS, Inc.).

Plaintiffs assert that Iowa law should not apply to determine access rights because the Trails Act preempts any state law relating to the right-of-way, including Iowa Code §§ 327G.11 and 327G.81. See Pls.' Reply to Def.'s Resp. to Pls.' Post-Trial Br. ("Pls.' Reply") at 10-12, ECF No. 121. This argument is unavailing. The STB has exclusive jurisdiction over transportation by rail carriers and "the construction, acquisition, operation, abandonment, or discontinuance of spur, industrial, team, switching, or side tracks, or facilities." 49 U.S.C. § 10501(b). Federal circuit courts of appeals have held that state laws with a "more remote or incidental effect on rail transportation" that do not "govern" or "manage" rail transportation are not within the exclusive jurisdiction of the STB and thus are not preempted. Franks Inv. Co.

LLC v. Union Pac. R.R., 593 F.3d 404, 410 & n.2 (5th Cir. 2010) (citing PCS Phosphate Co. v. Norfolk S. Corp., 559 F.3d 212, 218 (4th Cir. 2009); Adrian & Blissfield R.R. v. Village of Blissfield, 550 F.3d 533, 539 (6th Cir. 2008); New York Susquehanna & W. Ry. v. Jackson, 500 F.3d 238, 252, 254 (3d Cir. 2007); Florida E. Coast Ry. v. City of W. Palm Beach, 266 F.3d 1324, 1331 (11th Cir. 2001)). With regard to the Trails Act, which operates within the STB's jurisdiction, only abandonment claims have been held to be within the exclusive jurisdiction of the STB. See Dana R. Hodges Trust v. United States, 111 Fed. Cl. 452, 456-57 (2013). State law claims that do not deal with abandonment issues are not preempted by the Trails Act. Id.

With specific regard to access rights over a former railroad right-of-way under state law, both this court and the STB have held that such rights are not preempted by the Trails Act and thus state law continues to apply to those rights. Dana R. Hodges Trust, 111 Fed. Cl. at 457; Jie Ao and Xin Zhou—Petition For Declaratory Order, Docket No. FD 35539, 2012 WL 2047726 (S.T.B. June 4, 2012).[32] According to the STB in Jie Ao, "a prescriptive easement or other state law property interest permitting access to portions of a railroad [right-of-way], unless exclusive, does not typically unreasonably interfere with the present or future use of the property for activities that are part of railroad transportation." 2012 WL 2047726, at *3. Access easements across former railroad rights-of-way are considered to be "routine non-conflicting uses," and are not preempted "as long as they would not impede rail operations or pose undue safety risks." Id. at *6; see also New Orleans & Gulf Coast Ry. Co. v. Barrois, 533 F.3d 321, 333 (5th Cir. 2008); City of Lincoln v. Surface Transp. Bd., 414 F.3d 858, 863 (8th Cir. 2005). As plaintiffs were able to cross the right-of-way unimpeded when trains were still running, their access rights under Iowa law would not impede future rail operations if the railroad were to be reinstated.

Plaintiffs express concern about the safety of access because people have used the trail with unauthorized motorized wheeled vehicles such as four-wheelers and motorcycles. See Tr. 138:20-25 (N. Mosher). Additionally, the approaches to the access crossings provided by the trail operators have to be sufficiently gradual and wide to accommodate large agricultural machinery. Tr. 964:20 to 965:3 (Thien). In this respect, Iowa law mandates that the owner of the right-of-way has the obligation to ensure that plaintiffs' access is "safe and adequate." Iowa Code § 327G.11. The trail operators recognize the farmers' safety concerns, and have addressed, or will address, them via liability insurance, signage, law enforcement, and other "commonsense" means. See Tr. 1286:8-23, 1269:2-24 (Wieting). Therefore, plaintiffs' state law right to access and cross the right-of-way is not preempted by the Trails Act, and this right thus forecloses plaintiffs' claims for access damages in this case.

[32]Decisions of the STB interpreting the Trails Act are entitled to Skidmore deference. See Grosso v. Surface Transp. Bd., 804 F.3d 110, 116-17 (1st Cir. 2015) (applying Skidmore deference and upholding the STB's determination that state statutes and regulations regarding rail transportation were preempted by the jurisdictional grant to the STB). Thus, the court may consider decisions of the STB based on "the thoroughness evident in [the agency's] consideration, the validity of its reasoning, its consistency with earlier and later pronouncements, and all those factors which give it power to persuade, if lacking power to control." United States v. Mead Corp., 533 U.S. 218, 228 (2001) (quoting Skidmore v. Swift & Co., 323 U.S. 134, 140 (1944)).

Additionally, plaintiffs will not be awarded severance damages for maintenance costs related to access. Iowa Code §§ 327G.11 and 327G.81 explicitly impose those responsibilities and costs on the trail operator. See Tr. 1253:8-12 (Wieting) ("We're charged with, at Hardin County, for maintenance of this trail, so it would be our job to maintain that trail and those crossings . . . under our assumption for maintenance."). The trail operators have maintenance policies in place, including policies for weed control and maintaining the crossings. See Tr. 1243:19 to 1245:22 (Wieting); Tr. 1286:8-20, 1291:13-18 (Briggs). If the trail operators are not following these policies and are failing to control weeds and maintain the crossings, the United States is not liable for any resulting damage or costs to plaintiffs' property because these are exclusively matters of state law. Rather, plaintiffs may enforce Iowa Code §§ 327G.11 and 327G.81 against the local trail operators, not the United States, in Iowa state court.

In sum, plaintiffs have not incurred damages with regard to access to and over the right-of-way, landlocking, or crossing maintenance.

V. Interest

In addition to the just compensation determined supra, plaintiffs are also entitled to interest, reflecting a delay in payment from the date of the taking until the receipt of compensation following the entry of judgment. When there is such a delay, the owner of the property taken by the government shall receive interest "sufficient to ensure that he is placed in as good a position pecuniarily as he would have occupied if the payment had coincided with the appropriation." Kirby Forest Indus. v. United States, 467 U.S. 1, 10 (1984) (citing Phelps v. United States, 274 U.S. 341, 344 (1927); Seaboard Air Line Ry. v. United States, 261 U.S. 299, 306 (1923)). The parties litigated this issue with regard to the settlement class. The court held that the "rate of return from the Moody's Long-Term Aaa Corporate Bond Index [as of August 2, 2012], i.e., 3.39 percent, compounded quarterly, shall be used to determine the interest component of the just compensation due to the [settlement] subclass plaintiffs." Sears v. United States ("Sears II"), 124 Fed. Cl. 730, 737 (2016). The parties at trial did not contest the application of this interest rate, and thus the court shall apply the Moody's Aaa index to calculate delay damages with regard to the trial subclass.

CONCLUSION

For the reasons stated, the court amends its prior decision and the judgment to provide that the following amounts shall be awarded to plaintiffs:

Parcel Cluster	Value of Land Taken	(Less) Cost to Reclaim	Point Row Damages	Total
Gould	$64,010.25	($5,225.90)	$32,028.62	$90,812.97
Bradley	$34,146.74	($7,500.00)	$21,539.09	$48,185.83
Mosher	$32,438.08	($3,850.00)	$19,430.78	$48,018.86
Heene	$83,191.20	($38,073.33)	$29,655.22	$74,773.09
Richards	$91,508.72	($31,000.00)	$64,467.25	$124,975.97

Interest shall be payable on these amounts at the rate of 3.39 percent per annum, compounded quarterly from the date of the taking, August 2, 2012, until the date the judgment is paid.

Because there is no just reason for delay, the clerk is directed to enter judgment as amended pursuant to RCFC 54(b) in the aforestated amounts, apportioned amongst the members of the subclass of plaintiffs as shown in the table above. Plaintiffs may apply for an award of attorneys' fees and expenses under Section 304(c) of the Uniform Relocation Assistance Act, 42 U.S.C. § 4654(c), within 30 days after any appellate process has been concluded, or, alternatively, after the time for taking an appeal has expired. See RCFC 54(d)(2)(B) (incorporating 28 U.S.C. § 2412(d)(2)(G)).

It is so **ORDERED**.

s/ Charles F. Lettow
Charles F. Lettow
Judge